



# Chipless Radio Frequency Identification Reader Signal Processing (Wiley Series in Microwave and Optical Engineering)

*Nemai Chandra Karmakar, Prasanna Kalansuriya, Rubayet E. Azim, Randka Koswatta*

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**Presents a comprehensive overview and analysis of the recent developments in signal processing for Chipless Radio Frequency Identification Systems**

This book presents the recent research results on Radio Frequency Identification (RFID) and provides smart signal processing methods for detection, signal integrity, multiple-access and localization, tracking, and collision avoidance in Chipless RFID systems. The book is divided into two sections: The first section discusses techniques for detection and denoising in Chipless RFID systems. These techniques include signal space representation, detection of frequency signatures using UWB impulse radio interrogation, time domain analysis, singularity expansion method for data extraction, and noise reduction and filtering techniques. The second section covers collision and error correction protocols, multi-tag identification through time-frequency analysis, FMCW radar based collision detection and multi-access for Chipless RFID tags as well as localization and tag tracking.

- Describes the use of UWB impulse radio interrogation to remotely estimate the frequency signature of Chipless RFID tags using the backscatter principle
- Reviews the collision problem in both chipped and Chipless RFID systems and summarizes the prevailing anti-collision algorithms to address the problem
- Proposes state-of-the-art multi-access and signal integrity protocols to improve the efficacy of the system in multiple tag reading scenarios
- Features an industry approach to the integration of various systems of the Chipless RFID reader-integration of physical layers, middleware, and enterprise software

*Chipless Radio Frequency Identification Reader Signal Processing* is primarily written for researchers in the field of RF sensors but can serve as supplementary reading for graduate students and professors in electrical engineering and wireless communications.

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